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MINERAL RESOURCES, THEIR DEVELOPMENT, TREATMENT AND CONSEQUENCES

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Mineral Resources, their Development, their Treatment and Consequences.

by Walter J.Schmidt, D.phil., D.habil.

1.PREMISES.

11.Classification of mineral resources according to use and occurrence 1).

The position of individual deposits in this system depends:
on their principal nature,
on the relation to similar deposits and stand of knowledge of such,
on the status of production methods,
on the application possibilities for the products.
At different times different positions might be accorded to the same deposit and not in all instances can dividing lines be drawn sharply.

111.General worldwide use.
1111.Abundant occurrence.
Example: iron.
1112.Sporadic occurrence.
Example: copper.
112.Sporadic worldwide use.
1121.Abundant occurrence.
Example: Uranium.
1122.Sporadic occurrence.
Example: asbestos.
113.Only local use.
1131.Abundant occurrence.
Example: loam.
1132.Sporadic occurrence.
Example: dolomite.

12.Classification of mineral resources according to size of operation and value of products.

Also here no sharp boundary can be drawn, but the aim of the division is to show the difference in possibilities for a given deposit.

121.Manageable by individuals.
Scope of operations and value of products can be overseen and managed by an individual (not to be confused with ownership).
122.Manageable only as joint enterprise.
1221.Private ownership.
1222.Public ownership.
Public (national, state, government) ownership (in any form and extent) should be exercised only as exeption. In order to start or maintain the exploitation of certain mineral deposits it might be unavoidable that public institutions are used, as this might, though benefiting the public, under no circumstances at the time bring possibly any benefits to an individual enterprise and thus might not be undertaken at all otherwise.

Public influences, however, should never be exercised in order to take away a bigger share of the profits of a flourishing enterprise or industry than is general in this sector of the economy.

The form of ownership should be flexible and only dependant on the given situation. The question of private or public ownership should not become a dividing line along political convictions. No difference in the treatment of private and public ownership should be adopted.

13. Cross correlation of first and second classification, possibilities and consequences.

Any mineral deposit has to be investigated as to its position in the above outlined system. Already the exploration for such a deposit and later on the manner of ~~it~~ exploitation will depend on the recognition of its proper place, i.e. its given possibilities at the time. A wrong placement will cause wrong decisions and consequently damage the value of the deposit, possibly even prevent its utilisation completely. Some examples:

Copper deposits, in category 1112/122, have to face a worldwide competition. There is no sense in developing a small, high cost project for the world market. It might be worthwhile, however, if this deposit could fit into category 1132/122, i.e. if a local industry can make use of it and local conditions, though not allowing a general competition on the world market, by virtue of transport advantages, assurances of prompt and continuous supply or consideration of special wishes of the user, can provide a competitive basis in a specially given local market. This should not lead to the extreme of protecting a local noncompetitive production by customs, import restrictions or enforced acceptance.

Deposits of loam for simple brick production belong to category 1131/121. The costs for this raw material have to be almost nil. It does not tolerate any significant development or transportation expenses. Large scale investments in this field would be quite wrong, though technical advise provided to local interests could show valuable results.

Uranium can be found nearly everywhere. Its production at a given place depends solely on the demand and whether one is willing to pay the price. Hardly ever will there be any shortage. Therefore, this material, in category 1121/122, should be produced only if occurring under very favourable conditions. Current developments show that no protection can be counted on.

2. MEASURES.

One has to consider that measures with ~~xxxgx~~ regard to mineral resources in many cases have irrevocable consequences and also that investments (efforts of any nature) in the development of mineral resources take considerable time to show any results. Decisions therefore have a far stronger effect than in most other sectors of the economy.

Possibilities to influence the development of mineral resources can be exercised:

by the community ~~owning~~ alone the deposit, ~~is located,~~

by other communities (normally the ones using or also using the products),

by not directly interested international institutions,

by private enterprises.

With full intent the loose term "community" is used here and throughout this article. This is to indicate that various forms of public interest are present and involved. Specific terms like "state", ~~xxxxxxx~~ "nation",

"country", "government" are too restricted and open to changes, in their interpretation as well as in reality.

21. Measures by the community where the deposit is located.

Most important influence, predominant interest.

211. Provision of basis with mining legislation 2).

The basic mining legislation has to regulate the ownership of the mineral resources and the use made of them by the community and individuals.

2111. Ownership.

21111. Discovery rights.

21112. Landowner rights.

21113. Public rights.

Each of these should be used and adopted to suit the specific situation. The discovery rights with the ensuing compensation for exploration efforts will further exploration efforts. Landowner rights sometimes will tend to hold back exploration and exploitation, but in many cases are so deeply entrenched in public feeling that their complete disregard will not be advisable. Public rights (community ownership) leaves a wide field of interpretation and does not necessarily mean that all individual rights have to be superseded. Often a combination will be the most suitable, fitting the given situation at the time and also leaving way for further adaptions.

Under all circumstances the further promotion of exploration and production must be safeguarded. Discovery rights therefore, in one form or another, have to be protected and rewarded. Not necessarily, however, upheld at all costs, when it becomes evident that this would be detrimental to the further development of a deposit. Especially so when it turns out that this development is beyond the means (in any regard) of the discoverer. In this case the provision of an adequate reward should be aimed at and regarded as sufficient.

Public influences in any form should also never be such as finally to make the search for and the development of mineral resources appear senseless or right away impossible by individual activities. They should further this search and assure that adequate use is made of them. They should become directly active only in such cases, where this - though being in the public interest - would not otherwise take place at all.

2112. Taxes and royalties.

Enterprises engaged in the exploration and exploitation of mineral products cannot be treated taxwise equally to other industrial or mercantile enterprises, due to the nature of their operations. Their basis, the mineral deposit, is being depleted with the production and thus its value is becoming less and less the more it flourishes. In addition it is never possible to establish an accurate value of the enterprise, as the contents of mineral deposits and their value are predictable and comprehensible only to a certain degree and in addition are bound to change principally with further information on the extent and

nature of the deposit, with changes in technological possibilities and finally with changes in the use of the products. The accuracy varies with the type of commodity and no uniform rules can be applied. All this necessitates also further that a special risk factor in the production of mineral raw materials has to be taken into account. Whereas in most industrial and mercantile activities certain profitability calculations can be made, in the exploitation of mineral deposits this can be done only to a very limited extent. Therefore a compensation in some form must be present in order to attract the necessary investment (not to be taken as restricted to money), which otherwise could be turned to situations with more predictable outcomes. This refers specially to the exploration stage.

2113. Supervision.

Should be restricted to the protection of the actual public interest, with the interpretation of "proper use", "production obligation" and "conservation" not too narrow. Actually in almost all cases a coincidence of interests can be found.

By the way, all these principles apply with no less importance to liberal economic systems as to dirigistic systems, where only the terms "public" and "private" have to be replaced by terms customary there, just for example "basic" and "consumer".

212. Direct encouragement of prospection and production.

2121. Provision of essential services for prospection.

Creation and maintenance of a Geological Survey and a Mining Institute, which have to provide basic information and advise. Their services should be free and with no conditions attached.

Basic provisions comprise topographic maps, geological maps, geophysical base maps. A minimum would be aerial photographs. The unfortunate trend to regard the latter as of utmost secrecy is ridiculous at a time when all interested powers already doubtless have a full coverage.

Services should comprise determination of mineral samples, essaying, provision of skilled manpower for first investigations of discoveries, production and marketing problems, training of personnel.

Geological Survey and Mining Institute should be one unit.

2122. Provision of essential suppositions for production.

Refers mainly to the provision of the economic infrastructure, i.e. provision or at least help in the provision of transport and communication facilities, power requirements, water supply etc., but also of a working administration, legal protection and finally training of manpower. This is specially important in the case of small and middle sized enterprises, which without such provisions usually could not be established at all. Large scale enterprises on the other hand might be sometimes in a position not only to take care of some of these requirements themselves, but even can make them available to the general public.

2123. Economic assistance.

21231. Direct financial measures.

Supplying of grants or loans at costs adapted to the situation. This should take place only during the initial phases of an enterprise, when it otherwise might not be established at all or during times of acute crises, these, however, not being caused

inherently by nature of the enterprise itself and also be only of principally short term nature.

21232. Protective measures.

Their necessity should be governed by the same considerations as above. They can be grouped loosely in measures to protect from competition and in such to promote the ~~xxxxfxthexprodxctx~~ preferential use of the products.

The first group consists of subsidies in various forms, tax allowances, export premiums, import restrictions, customs.

The second consists of provisions for the preferential acceptance of products, ranging from mere information of the public to enforcing such preferential acceptance.

2124. Psychological assistance.

Though mainly effective only for individuals, nevertheless this field should not be neglected. Special importance should be attached to it in areas, which do not - yet - have a fully developed mining industry and where accordingly the sense for mineral resources amongst the general public is not - yet - very well developed.

21241. Protection of ideas and performed work.

Measures should be complementary to the ones envisaged in a basic mining law protecting discovery rights. The problems connected with this range from the possibility of a simple denial of such rights to their worthlessness due to the impossibility of making use of an idea or a discovery on account of inadequate means available. Legal provisions regulating ownership rights of mineral deposits are not sufficient to tackle this problem. They must be supplemented by measures of friendly assistance and, where necessary, benevolent treatment by the public agencies concerned.

21242. Rewards for individual activities.

Not always is it possible in cases of a discovery or a new idea for the person concerned to retain full rights, already for technical reasons or the given basic situation, but also because the exercising of these rights might be beyond his means and any try to retain the rights completely might be finally detrimental not only to the public but also to the person concerned as well. For these cases provisions should be made for a machinery to secure a due reward, taking into account the value of the discovery or idea in relation to the value of the further devleopment necessary. The best form for this will be the creation of some lasting relationship of primary and consequent rights. Thus a permanent participation of the original rights can be secured without, however, endangering the progress of the whole enterprise. Practical experience shows that an independant machinery to aid in finding such a solution is highly desirable, as otherwise the forces engaged are usually of too unequal attitude and size and progress in a given enterprise as well as in efforts to find new possibilities, both of which are also desirable by the public, might be curbed.

Very useful is already a simple scheme of monetary rewards for any sample of mineral raw materials brought in from places hitherto unknown, to be administered and judged by the local Geological Survey. Should a valuable mineral deposit actually be found at the spot, a further reward could be accorded the bringer of the sample. It is quite clear that in most cases the samples themselves will be worthless, but valuable clues can be obtained and the Geological Survey will obtain by this procedure a considerable number of very interested helpers, especially when the application of the rewards is handled not too strictly.

21243. Spread of information.

Should be in two forms.

Support for scientific investigations and publication of their results. Although in many cases no immediate cash value can be attributed to these efforts, sooner or later they will also be needed for practical purposes. Generous support will attract a greater number of scientific personnel and will result in more work being done than would be, when these matters are left to individual interests.

The second task should be the provision of information on matters of mineral resources for the general public, thus spreading some basic knowledge and at the same time rising interest. This should not only be done by means of easily understandable booklets on mineral raw materials, their recognition and the mode of their occurrence for the layman (so as to provide anybody with at least a crude tool to go prospecting himself or, if he encounters something unusual of at least recognising this as something unusual and providing him with some guidance what to do and where to get help - an education to be included principally also already in all school systems), but also by a permanent flow of information to the general press, thus keeping the public informed and interested in mineral resources. Regular publication of awards accorded or progress achieved or special possibilities and requirements will not only find interested readers, ~~in general,~~ but will certainly also bring always some additions to the number of active prospectors.

22. M e a s u r e s b y o t h e r c o m m u n i t i e s .

The interest of other communities in this connection should stem solely from their use of the mineral resources concerned. All measures should be guided by a blunt exchange of interests on a broad scale. Other considerations should be clearly marked as such and should not be hidden behind this basic mutual interest. Any other path sooner or later will lead to problems and to a deterioration in the relations of the two communities. Exploitation of special situations in whatever form, which is always possible from time to time, will also cause sooner or later difficulties and the short term advantages possibly gained will be outweighed by later disadvantages. There should always be a fair deal with no false pretenses and no false expectations. Political interests, which sometimes cannot be ignored, should be declared as such and especially so when economic measures are influenced by them or ensuing.

By all assistance rendered, it must be understood that the giving

side does so in order to reap benefits in one form or the other for itself sooner or later. A "gift attitude" of any of the two sides will necessarily poison the relationship and must never be allowed to develop.

221. Technical assistance.

Essentially short term nature and complementary to measures taken by the community concerned itself.

222. Economic assistance.

2221. Directly.

Grants or loans, which, however should be restricted to similar cases as outlined above.

Direct establishments of public enterprises within other communities is always bound to create problems and therefore not recommendable to any of the sides concerned.

2222. Indirectly.

Preferential treatment of the products or their protection from competition. These again should be taken only as short term measures during times of special strain as outlined above.

23. M e a s u r e s b y i n t e r n a t i o n a l i n s t i t u t i o n s.

The greatest difficulty here is to exclude individual political or economic interests. Therefore it appears preferable to leave the principle of entirely free services, because somebody in the end has to provide the necessary funds and sooner or later in one form or the other - and with good justification - will want to exercise an influence. In order to avoid this, the creation of advising organisations, asking modest charges and being desinterested otherwise, will be necessary. In extreme cases, losses can then be carried by modest profits achieved elsewhere. These organisations should not work in contrast to assistance rendered by individual enterprises or communities, but complement these efforts and especially so in fields, where these other parties are not interested or not in a position to be active. One absolute necessity, however, will be that these international institutions must have a permanent staff. Only thus can they hope to attract the necessary high quality personnel and assure their independant judgement. Experts hired for specific tasks and for specific times only, cannot possibly exercise completely free judgement (even if they are prepared to make themselves available, a fact in itself already improbable).

Details according to corresponding previous paragraphs.

231. Technical assistance.

232. Economic assistance.

2321. Directly.

2322. Indirectly.

24. M e a s u r e s b y p r i v a t e i n t e r e s t s.

Similar to the measures by other communities, however, more restricted to specific fields. Here again, and even more so, the mutual interests must be clear. Under all circumstances should they be restricted to the economic field. The community concerned also must realise that an incentive for such activities has to be present.

If the form of establishing an entire enterprise is chosen, this should lose as soon as possible - if it cannot be avoided from the beginning - its outside appearance and adapt itself as far as possible, and preferably completely, as a local enterprise (which not necessarily touches questions of ownership). No preferential treatment whatsoever should be asked for or expected on the mere account of coming from the outside. Though sometimes such preferential

treatment might even be offered in order to attract the establishment, which perhaps could not be achieved with local means, sooner or later problems will develop from this and cause in the end more disadvantages than the advantages gained in the first place.

Details according to corresponding previous paragraphs.

241. Technical assistance.

242. Economic assistance.

2421. Directly.

2422. Indirectly.

Payment conditions.

3. CONCLUSIONS.

The development of the mineral resources of a community depends:

on the presence of mineral resources,

on the demand for the mineral resources present,

on the measures taken for the exploration and exploitation of the mineral resources present.

The first factor can be influenced only indirectly, by making an effort to find out about the given possibilities. Also the second factor can be influenced only indirectly by exploring possibilities for the use of the available products and by adapting their production and preparation. Only the third factor depends entirely on the influences exercised by the community. The attitude of the community and their measures taken thus influence directly the development of the mineral resources and consequently [illegible] of the entire economy. The importance of this goes far beyond the basic industry.

Mineral resources are specially sensitive to measures taken and effects tend to make themselves felt longer and stronger than in other industrial sectors. The approach of any community towards the development of their mineral resources therefore should never be governed by dogmatic or theoretical political and economic ideas or emotions resulting in very dangerous experiments, but solely by evaluating the possibilities as presented by nature and uses possible and adopting the most suitable attitude, resulting in the utmost benefit for all.

Footnotes:

1) W.J.Schmidt "Some Basic Problems of Mining and their Importance for the Development Countries" Bustan, 3, Vienna 1962.

2) W.J.Schmidt "What Private Industry Expects from a Mining Legislation in Development Countries" Confrontation, 2, Vienna 1962.

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